

**CPC****COOPERATIVE PATENT CLASSIFICATION****C21C**

**PROCESSING OF PIG-IRON, e.g. REFINING, MANUFACTURE OF WROUGHT-IRON OR STEEL  
TREATMENT IN MOLTEN STATE OF FERROUS ALLOYS** ([refining metals in general C22B 9/00](#))

**Guide heading:****C21C 1/00**

**Refining of pig-iron  
Cast iron**

[C21C 1/02](#)

- . Dephosphorising or desulfurising

[C21C 1/025](#)

- . . {Agents used for dephosphorising or desulfurising }

[C21C 1/04](#)

- . Removing impurities other than carbon, phosphorus or sulfur

[C21C 1/06](#)

- . Constructional features of mixers for pig-iron

[C21C 1/08](#)

- . Manufacture of cast-iron

[C21C 1/10](#)

- . Making spheroidal graphite cast-iron

[C21C 1/105](#)

- . . {Nodularising additive agents }

**C21C 3/00**

**Manufacture of wrought-iron or wrought-steel**

**C21C 5/00**

**Manufacture of carbon-steel, e.g. plain mild steel, medium carbon steel or cast steel** {or stainless steel }

[C21C 5/005](#)

- . {Manufacture of stainless steel }

[C21C 5/02](#)

- . Crucible furnace process { ([C21C 5/005 takes precedence](#)) }

[C21C 5/04](#)

- . Manufacture of hearth-furnace steel, e.g. Siemens-Martin steel { ([C21C 5/005 takes precedence](#)) }

[C21C 5/06](#)

- . . Processes yielding slags of special composition

[C21C 5/28](#)

- . Manufacture of steel in the converter { ([C21C 5/005 takes precedence](#)) }

[C21C 5/285](#)

- . . {Plants therefor }

[C21C 5/30](#)

- . . Regulating or controlling the blowing

[C21C 5/305](#)

- . . . {Afterburning }

[C21C 5/32](#)

- . . . Blowing from above ([C21C 5/35 takes precedence](#))

[C21C 5/34](#)

- . . . Blowing through the bath ([C21C 5/35 takes precedence](#))

[C21C 5/35](#)

- . . . Blowing from above and through the bath

[C21C 5/36](#)

- . . Processes yielding slags of special composition

- C21C 5/38 .. Removal of waste gases or dust
- C21C 5/40 ... Offtakes or separating apparatus for converter waste gases or dust
- C21C 5/42 .. Constructional features of converters
- C21C 5/44 ... Refractory linings
  - C21C 5/441 .... {Equipment used for making or repairing linings }
  - C21C 5/443 ..... {Hot fettling; Flame gunning }
  - C21C 5/445 .... {Lining or repairing the taphole }
- C21C 5/46 ... Details or accessories
  - C21C 5/4606 .... {Lances or injectors }
  - C21C 5/4613 ..... {Refractory coated lances; Immersion lances }
  - C21C 5/462 ..... {Means for handling, e.g. adjusting, changing, coupling }
  - C21C 5/4633 .... {Supporting means }
  - C21C 5/464 ..... {Trunnion bearings }
  - C21C 5/4646 .... {Cooling arrangements }
  - C21C 5/4653 .... {Tapholes; Opening or plugging thereof }
  - C21C 5/466 .... {Charging device for converters }
  - C21C 5/4673 .... {Measuring and sampling devices }
  - C21C 5/4686 .... {Vehicles for supporting and transporting a converter vessel }
  - C21C 5/4693 .... {Skull removal; Cleaning of the converter mouth }
- C21C 5/48 .... Bottoms or tuyères of converters
- C21C 5/50 .... Tilting mechanisms for converters
  
- C21C 5/52 . Manufacture of steel in electric furnaces ( {[C21C 5/005](#) takes precedence }; [electric heating per se H05B](#) )
- C21C 5/5205 .. {in a plasma heated furnace }
- C21C 5/5211 .. {in an alternating current (AC) electric arc furnace }
- C21C 5/5217 ... {equipped with burners or devices for injecting gas, i.e. oxygen, or pulverulent materials into the furnace }
- C21C 5/5229 .. {in a direct current (DC) electric arc furnace }
- C21C 5/5241 .. {in an inductively heated furnace }
- C21C 5/5247 ... {processing a moving metal stream while exposed to an electromagnetic field, e.g. in an electromagnetic counter current channel }
- C21C 5/5252 .. {in an electrically heated multi-chamber furnace, a combination of electric furnaces or an electric furnace arranged for associated working with a non electric furnace }
- C21C 5/5264 .. {Manufacture of alloyed steels including ferro-alloys }
- C21C 5/527 .. {Charging of the electric furnace }
- C21C 5/5294 .. {General arrangement or layout of the electric melt shop }
- C21C 5/54 .. Processes yielding slags of special composition
  
- C21C 5/56 . Manufacture of steel by other methods ([making liquid steel by direct processes C21B 13/00](#)) { ([C21C 5/005](#) takes precedence) }
- C21C 5/562 .. {starting from scrap }
- C21C 5/565 ... {Preheating of scrap ([apparatus for preheating scrap in general F27D 13/002](#)) }
- C21C 5/567 .. {operating in a continuous way }

**C21C 7/00**      **Treating molten ferrous alloys, e.g. steel, not covered by groups [C21C 1/00](#) to [C21C 5/00](#) (treating molten metals during moulding [B22D 1/00](#), [B22D 27/00](#); remelting ferrous metals [C22B](#) )**

- C21C 7/0006      .    {Adding metallic additives }
- C21C 7/0025      .    {Adding carbon material }
- C21C 7/0037      .    {by injecting powdered material }
- C21C 7/0043      . .    {into the falling stream of molten metal }
- C21C 7/005      .    {using exothermic reaction compositions }
- C21C 7/0056      .    {using cored wires }
- C21C 7/0068      .    {by introducing material into a current of streaming metal }
- C21C 7/0075      .    {Treating in a ladle furnace, e.g. up-/reheating of molten steel within the ladle }
- C21C 7/0081      .    {Treating and handling under pressure }
- C21C 7/0087      .    {Treatment of slags covering the steel bath, e.g. for separating slag from the molten metal }
- C21C 7/04      .    Removing impurities by adding a treating agent
- C21C 7/06      . .    Deoxidising, e.g. killing
- C21C 7/064      . .    Dephosphorising  
Desulfurising
- C21C 7/0645      . . .    {Agents used for dephosphorising or desulfurising }
- C21C 7/068      . .    Decarburising
- C21C 7/0685      . . .    {of stainless steel }
- C21C 7/072      . .    Treatment with gases ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)
- C21C 7/076      . .    Use of slags or fluxes as treating agents ([C21C 7/06](#), [C21C 7/064](#), [C21C 7/068](#) take precedence)
- C21C 7/10      .    Handling in a vacuum

**Guide heading:**

**C21C 2005/00**      **Manufacture of carbon-steel, e.g. plain mild steel, medium carbon steel or cast steel {or stainless steel }**

- C21C 2005/28      .    Manufacture of steel in the converter { ([C21C 5/005](#) takes precedence) }
- C21C 2005/36      . .    Processes yielding slags of special composition
- C21C 2005/363      . . .    Slag cements
- C21C 2005/366      . . .    Foam slags

- C21C 2005/42 . . . Constructional features of converters
- C21C 2005/44 . . . Refractory linings
- C21C 2005/445 . . . . {Lining or repairing the taphole }
- C21C 2005/446 . . . . Dry linings
- C21C 2005/448 . . . . Lining wear indicators
- C21C 2005/46 . . . Details or accessories
- C21C 2005/4606 . . . . {Lances or injectors }
- C21C 2005/4626 . . . . Means for cooling, e.g. by gases, fluids or liquids
- C21C 2005/466 . . . . {Charging device for converters }
- C21C 2005/4666 . . . . for charging with organic contaminated scrap
- C21C 2005/4673 . . . . {Measuring and sampling devices }
- C21C 2005/468 . . . . Means for determining the weight of the converter
  
- C21C 2005/52 . . . Manufacture of steel in electric furnaces ( {C21C 5/005 takes precedence }; electric heating per se H05B )
- C21C 2005/5211 . . . {in an alternating current (AC) electric arc furnace }
- C21C 2005/5223 . . . with post-combustion
- C21C 2005/5229 . . . {in a direct current (DC) electric arc furnace }
- C21C 2005/5235 . . . with bottom electrodes
- C21C 2005/5258 . . . with crater formed by down-melting of scrap or charge through electrode or lance
- C21C 2005/527 . . . {Charging of the electric furnace }
- C21C 2005/5276 . . . with liquid or solid rest, e.g. pool, "sumpf"
- C21C 2005/5282 . . . with organic contaminated scrap
- C21C 2005/5288 . . . Measuring or sampling devices
  
- C21C 2007/00** **Treating molten ferrous alloys, e.g. steel, not covered by groups C21C 1/00 to C21C 5/00 (treating molten metals during moulding B22D 1/00, B22D 27/00; remelting ferrous metals C22B )**
  
- C21C 2007/0006 . . {Adding metallic additives }
- C21C 2007/0012 . . . Lead
- C21C 2007/0018 . . . Boron
  
- C21C 2007/0025 . . {Adding carbon material }
- C21C 2007/0031 . . . being plastics, organic compounds, polymers
  
- C21C 2007/0056 . . {using cored wires }
- C21C 2007/0062 . . . with introduction of alloying or treating agents under a compacted form different from a wire, e.g. briquette, pellet
  
- C21C 2007/0093 . . Duplex process  
Two stage processes

**Guide heading:**

**C21C 2100/00 Exhaust gas**

- C21C 2100/02 . Treatment of the exhaust gas
- C21C 2100/04 . Recirculation of the exhaust gas
- C21C 2100/06 . Energy from waste gas used in other processes

**Guide heading:****C21C 2200/00 Recycling of waste material**
**C21C 2250/00 Specific additives**  
**Means for adding material different from burners or lances**

- C21C 2250/02 . Hot oxygen
- C21C 2250/04 . Liquid gas
- C21C 2250/042 . . Liquid oxygen
- C21C 2250/06 . Hollow electrode
- C21C 2250/08 . Porous plug

**C21C 2300/00 Process aspects**

- C21C 2300/02 . Foam creation
- C21C 2300/04 . Avoiding foam formation
- C21C 2300/06 . Modeling of the process , e.g. for control purposes  
CII
- C21C 2300/08 . Particular sequence of the process steps